

A new Coniacian–Santonian conchostracan genus from the Bauru Group, south-east Brazil: Taxonomy, palaeobiogeography and palaeoecology

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Received 31 August 2004; accepted in revised form 28 February 2005

Available online 6 September 2005

Abstract

Abundant conchostracans occur in Coniacian–Santonian dark grey, argillaceous, lacustrine sediments of the São Carlos Formation, Bauru Group, Paraná Basin, in the central part of São Paulo State, south-east Brazil. They are ascribed to a new genus and species, *Bauruetheria sancarlensis*, included in the family Jiliniestheriidae. The new taxon is similar to some Late Cretaceous species from China and Mongolia. It probably evolved from a Late Jurassic–Early Cretaceous ancestral form (*Migransia*), which first lived in West Gondwana, and later dispersed to Europe and Asia, originating distinct parallel lineages with increasing ornamental complexity. The conchostracans probably lived in oxygenated marginal areas of a very calm, perennial lake with an anoxic bottom, and were transported in suspension to the depositional site by weak turbidity currents or storm-induced flows. Great concentrations of juvenile conchostracans in some thin layers can be related to mass mortality episodes caused by convection and dispersion of anoxic water during storms.

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Keywords: Conchostraca; Coniacian–Santonian; Upper Cretaceous; Bauru Group; Paraná Basin; Brazil; Anoxic lake

1. Introduction

Upper Cretaceous conchostracans have rarely been reported from Brazilian sedimentary basins. Only two species have been described previously: *Palaeolimnadiopsis suarezi* Mezzalira, 1974 from the Adamantina Formation, Bauru Group in the Paraná Basin, western São Paulo State (Mezzalira, 1974) and “*Estheriina*” *astartoides* Jones from the Jandaíra Formation in the Potiguar Basin, north-east Brazil (Lana and Carvalho, 2001, 2002).

This paper presents data on the taxonomy, palaeobiogeography, palaeoecology and evolution of a new conchostracan genus and species from the São Carlos Formation of the Bauru Group. The occurrence of these fossils was previously mentioned by Castro et al. (2002).

2. Geology, location and material

Occupying an area of over 350,000 km², and a maximum thickness of 300 m, the Aptian–Maastrichtian Bauru Group, consisting of the Caiuá, Santo Anastácio, Adamantina, São Carlos and Marília formations, is the uppermost unit of the Palaeozoic–Mesozoic succession of the Paraná Basin (Soares et al., 1980; Castro et al., 2002). It is predominantly composed of reddish continental

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sediments, including sandstones, claystones, shales and caliches, which represent eolian, aluvial, fluvial and lacustrine deposits that accumulated in a hot and arid to semi-arid environment (e.g., Soares et al., 1980; Suguio and Barcelos, 1983; Dias-Brito et al., 2001).

Fossiliferous beds of the Adamantina, São Carlos and Marília formations contain vertebrates (e.g., crocodiles, dinosaurs, turtles, fishes, snakes), invertebrates (bivalves, gastropods, conchostracans), rare plants and microfossils (ostracodes, charophytes and palynomorphs). Micropaleontological data indicate, respectively, Turonian–Santonian, Coniacian–Santonian and Maastrichtian (late Maastrichtian?) ages for these formations (Dias-Brito et al., 2001; Castro et al., 2002).

The material on which this paper is based comes from a lacustrine rhythmite of the Fazenda Nossa Senhora de Fátima Member (FNSF Member) at the type locality of the São Carlos Formation, close to the town of São Carlos (UTM 23 7577.6 km, 197.75 km), central São Paulo State (Figs. 1, 2). The FNSF Member contains palynomorphs, ostracods, conchostracans, vertebrate fragments, molluscs and plants (Castro et al., 2002). The new conchostracan taxon described here is found in the lower FNSF2, which is a dark grey silty-argillaceous rhythmite. This interval is rich in organic matter (TOC reaching 2.48%; Castro et al., 2002), which is predominantly amorphous, and contains, according to M. Arai, in Castro et al. (2002), abundant palynomorphs (pollen dominated by ephedroids and *Classopollis classoides*, spores, fungal filaments, prasinophyceans and presumed copepod eggs). Castro et al. (2002) considered their data to indicate a distal lacustrine environment with anoxic conditions on the lake bottom, in a warm, semi-arid climate, where the rhythmite originated by the action of weak turbidity currents or wave flows in the lake. The Coniacian–Santonian age of these sediments is supported by palynostratigraphic studies (M. Arai, in Castro et al., 2002), using the Petrobras biochronostratigraphic zonation scheme prepared for the marine coastal basins of south-east Brazil. Previous palynological studies (Lima et al., 1986) dated these sediments as Coniacian.

The fossils studied are deposited in the collections of the São Paulo State University (UNESP), in Rio Claro, Brazil, and are referred to as UNESPλ-B. Our analyses were made using a microscope connected to a drawing tube, at magnifications up to $\times 100$. The specimens UNESPλ-B-1 to B-34 were selected for scanning electron microscope (SEM) studies at CCDM, Universidade Federal de São Carlos (UFSCAR).

3. Systematic palaeontology

Order: Conchostraca Sars, 1867 (via Tasch, 1969)

Suborder: Spinicaudata Linder, 1945 (via Tasch, 1969)

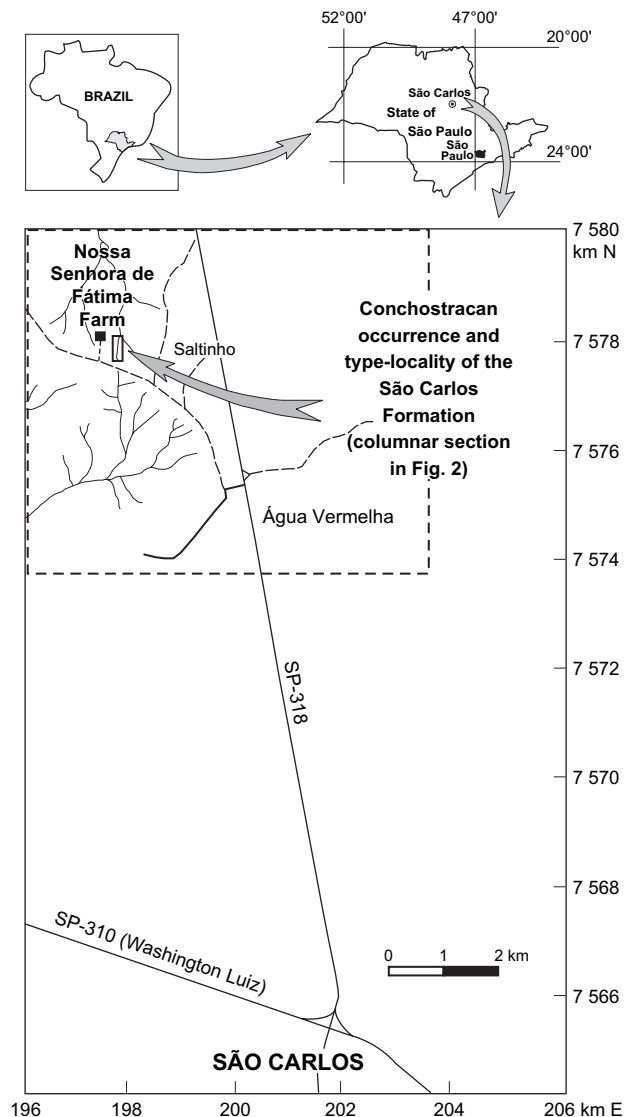


Fig. 1. Outcrop location of Nossa Senhora de Fátima Farm.

Superfamily: Estheriteoidea Zhang and Chen in Zhang et al., 1976

Family: Jilinstheriidae Zhang and Chen in Zhang et al., 1976

Genus *Bauruesthesia* gen. nov.

Derivation of name. From the Bauru Group.

Type species. *Bauruesthesia sancarlensis* gen. et sp. nov.

Type locality and stratigraphic horizon. Nossa Senhora de Fátima Farm, São Carlos, São Paulo State, Brazil; São Carlos Formation, Bauru Group, Paraná Basin, Coniacian–Santonian (Upper Cretaceous).

Diagnosis. Carapace small or moderate in size, elliptical or oval in outline; dorsal margin slightly arched and

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